



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: J. Ibbetson, et al. Confirmation No. 2851
Serial No. 10/786,755 Examiner: Perry, Anthony
Filed: February 24, 2004 Art Unit: 2879
Docket No. P0285US-7 Customer No. 23935

Title: COMPOSITE WHITE LIGHT SOURCE AND METHOD FOR
FABRICATING

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF JAMES IBBETSON

I, James Ibbetson, declare:

1. I am the first-named co-inventor of the invention which is the subject of the above-identified patent application.

2. I was an employee for Cree Lighting Company, now incorporated as Cree, Inc., at all times mentioned herein through the date of execution of this declaration.

3. I am informed that claims 1-3, 8-10, 12-25 and 27-42 of the application have all been rejected as being anticipated by Sugimoto et al. (WO 03/010832) (hereafter "Sugimoto WO"). We are further informed that Sugimoto WO bears a publication date of February 6, 2003.

4. I submit the following facts and documentary evidence establishing our conception and actual reduction to practice of the claimed invention prior to February 6, 2003. All of these activities took place in the United States.

5. Prior to February 6, 2003, I was involved in the preparation of an "Invention Disclosure" and submitted it to the Intellectual Property Committee of my employer, Cree Lighting Company, subsequently incorporated as CREE, Inc. A true and accurate copy of the "Invention Disclosure" is appended hereto as Exhibit A. The "Invention Disclosure" bears my signature at the bottom along with the signature of a coinventor, Eric Tarsa, and the signatures of three witnesses. Various dates, including the dates of our signatures, the date of conception and the date of reduction to practice, have been redacted from the appended Exhibit A; all of those dates, however, are prior to February 6, 2003. Other portions of Exhibit A not pertinent to this Declaration have also been redacted.

6. The disclosure of Exhibit A is titled "Composite White LED Chip and Method for Making Same" and describes the invention on the second page as:

a novel composite LED chip in which a 'pre-fabricated' phosphor-loaded shell or lens is attached to a base semiconductor LED chip in order to create, for instance, a white-emitting LED chip, and a method for creating said composite chip.

Some of the advantages the invention offers are listed on the same page:

Easier to control thickness uniformity of phosphor coating; and

Shell or lens can be tested and screened or binned for uniformity and color separately, thereby improving overall yield of the composite chip.

A possible application for the invention is listed on the third page of Exhibit A as:

Anywhere a white LED lamp is used (or indeed any other color produced by down conversion).

A figure showing an embodiment of an emitter in various stages of assembly is also included on the second page of Exhibit A.

✓ The foregoing explicitly or implicitly discloses each and every limitation of at least claims 1, 18 and 32.

7. Subsequent to the date of invention but prior to February 6, 2003, I was involved with a series of tests for emitters that embody all of the limitations of independent claims 1, 18 and 32. The results of these tests along with other information are recorded in a "Final Report" document. A true and accurate copy of the "Final Report" is appended hereto as Exhibit B. The "Final Report" includes tabular data and several graphs detailing the results of tests involving the emitters. Various dates (including Test Numbers which clearly indicate dates) have been redacted from the appended Exhibit B; all of those dates, however, are prior to February 6, 2003.

Other portions of Exhibit B not pertinent to this Declaration have also been redacted.

8. Exhibits A and B together disclose, implicitly or explicitly, each and every element of rejected claim 1 (currently amended) of our application, namely:

a light source which emits a first spectrum of light; and

a conversion material region formed separately from said light source and including conversion particles, said conversion material region positioned in proximity to said light source such that at least some of said light source light passes through said conversion material region, said conversion particles absorbing at least some of said light source light passing through said conversion material region and emitting a second spectrum of light,

wherein said first spectrum of light and said second spectrum of light are combined within said conversion material region, said emitter emitting a combination of said first and second spectrums at a substantially uniform color and intensity.

9. Exhibits A and B also implicitly or explicitly disclose each and every element of claim 18, namely:

a light source which emits a first spectrum of light; and

a conversion material region formed separately from said light source and positioned proximate to said light source, said conversion material region arranged to absorb at least some of the light emitted by said light source and re-emit light at a second spectrum of light, said emitter emitting a combination of said first and second spectrums of light in a uniform third spectrum of light.

10. Exhibits A and B also implicitly or explicitly disclose each and every limitation of claim 32, namely:

providing a light source;
providing a separately formed conversion material region which includes conversion particles; and

bonding said conversion material region proximate to said light source, said conversion material region being positioned so that at least some of the light emitted from said light source at different angles flows through said conversion material region and through the substantially the same amount of conversion particles.

11. Exhibit B demonstrates an actual reduction to practice of the subject matter of claims 1, 18 and 32 prior to February 6, 2003. The Final Report was prepared by myself and others prior to February 6, 2003, and presents, among other things, the information we obtained during our testing. The photographs on

the first page of the Final Report show an array of white LED lamps. Each of these lamps embodies all of the limitations of claims 1, 18 and 32. In the Packaging Features section of the Final Report, it is indicated that the LEDs include separately formed "Epoxy Domes loaded with 1.5% Phosphor Concentration." The phosphor is uniformly distributed throughout the dome structure to achieve an emission profile having a uniform intensity and color. The phosphor within the domes functions as a wavelength downconverting material (i.e., conversion particles). Thus, the light source emits a first spectrum of light. The Nominal Wavelength is indicated as 470nm which is blue light. The blue light passes through the phosphor loaded dome where some of the light is downconverted. Thus, the light escapes as a combination of unconverted blue light and downconverted yellow light, forming a second spectrum of light which appears white in this embodiment.

12. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the U.S. Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: June 15, 2007



James Ibbetson
June 15, 2007

